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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/624,857	07/24/2000	David Mottier	0054-0215P	6255
2292	7590	01/25/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			SHAH, CHIRAG G	
			ART UNIT	PAPER NUMBER
			2664	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/624,857	Applicant(s) MOTTIER ET AL.	
	Examiner Chirag G Shah	Art Unit 2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11/16/04.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 18-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-21, 23, 31 and 34 is/are rejected.
- 7) ☒ Claim(s) 22, 24-30, 32 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/24/00 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 18-21, 23, 31 and 34 rejected under 35 U.S.C. 102(a) as being anticipated by Popovic ("Spreading Sequences for Multi-Carrier CDMA Systems").

Referring to claim 18, Popovic discloses in figure 1 and on page 1 and in the selection criteria for MC-CDMA sequences section of page 2 of a method of assigning one or more spreading sequences  $[S_m(K)]$  among a family of spreading sequences [class of sequences, e.g. Walsh-Hadamard, Gold, Orthogonal Gold, Zadof Chu, Huffman, etc.] to a user  $[m]$  of a multi-carrier code division multiple access transmission network [MC-CDMA], each element of the sequence being, at the level of a transmitter [shown in figure 1] of the network, multiplied  $[x]$  by a data item  $[D_m(t)]$  to be transmitted and then transmitted on a corresponding sub-carrier [as disclosed in figure 1 and respective portions of the specification on page 1, data symbol  $D_m(t)$  is transmitted in parallel over  $N$  carriers, each multiplied by a different element of the spreading sequences  $S_m(k)$  assigned to the user  $m$ ], comprising:

assigning, to the user one or more spreading sequences [user is assigned as disclosed in 3<sup>rd</sup> paragraph of 1<sup>st</sup> col. on page 1 and in 1<sup>st</sup> paragraph of 2<sup>nd</sup> col. on page 2,  $S_m(K)$  spreading sequences], so as to minimize a function representing the interference between the one or more sequences [as disclosed in section 2-Selection criteria for MC-

CDMA sequences on page 2-3, according to figure 1,  $S_m(k)$  is employed for spreading and is the spreading sequence assigned to the user  $m$ , spectral correlation function is used for evaluation of MC-CDMA sequence, the spectral correlation function as disclosed in column 1 of page 3, is the measure of mutual interference between a pair of users in the MC-CDMA system and spectral PDFs are calculated for a few different classes of spreading sequences and overall system performance is used to select the best set of spreading sequence. The best set of spreading sequence  $S_m(K)$  is employed and assigned for figure 1 using the same aforementioned basic criterion as is the case on page 2, last paragraph of page 2, where orthogonal sequence is employed].

spreading sequences of a predetermined set on the other hand, the predetermined set between included in the family of spreading sequences [as disclosed in the abstract and in section 2, classes of sequences from a predetermined set in the family of spreading sequences, such as Walsh and Gold sequences, as well as Orthogonal Gold and Zadoff-Chu sequences are evaluated with respect to the spectral correlation function in order to select the sequences that provide the best performance for the user] as claim.

Referring to claim 34, a transmitter [MC-CDMA transmitter shown in figure 1] for a Multi-Carrier Code Division Multiple Access transmission system that assigns one or more spreading sequences [ $S_m(K)$ ] among a family of spreading sequences [class of sequences, e.g. Walsh-Hadamard, Gold, Orthogonal Gold, Zadoff-Chu, Huffman, etc.] to a user [ $m$ ] of a Multi-Carrier Code Division Multiple Access [MC-CDMA] transmission network, each element of the sequence being, at the level of a transmitter (shown in figure 1) of the network, multiplied [ $\times$ ] by a data item [ $D_n(t)$ ] to be transmitted and then transmitted on a corresponding sub-carrier, [as

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disclosed in figure 1 and respective portions of the specification on page 1, data symbol  $D_m(t)$  is transmitted in parallel over  $N$  carriers, each multiplied by a different element of the spreading sequences  $S_m(k)$  assigned to the user  $m$ ], the transmitter comprising:

means for assigning, to the user, the one or more spreading sequences [user  $m$  is assigned as disclosed in 3<sup>rd</sup> paragraph of 1<sup>st</sup> col. on page 1 and in 1<sup>st</sup> paragraph of 2<sup>nd</sup> col. on page 2,  $S_m(K)$  spreading sequences]; and

means for minimizing a function representing the interference between the one or more sequences [as disclosed in section 2-Selection criteria for MC-CDMA sequences on page 2-3, according to figure 1,  $S_m(k)$  is employed for spreading and is the spreading sequence assigned to the user  $m$ , spectral correlation function is used for evaluation of MC-CDMA sequence, the spectral correlation function as disclosed in column 1 of page 3, is the measure of mutual interference between a pair of users in the MC-CDMA system and spectral PDFs are calculated for a few different classes of spreading sequences and overall system performance is used to select the best set of spreading sequence. The best set of spreading sequence  $S_m(K)$  is employed and assigned for figure 1 using the same aforementioned basic criterion as is the case on page 2, last paragraph of page 2, where orthogonal sequence is employed]., and

spreading sequences of a predetermined set, on the other hand, the predetermined set being included in the family of spreading sequences [as disclosed in the abstract and in section 2, classes of sequences from a predetermined set in the family of spreading sequences, such as Walsh and Gold sequences, as well as Orthogonal Gold and Zadoff-

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chu sequences are evaluated with respect to the spectral correlation function in order to select the sequences that provide the best performance for the user] as claim.

Referring to claim 19, Popovic discloses in figure 1 and in section 2 on pages 2 and 3 of a method wherein the predetermined set of spreading sequences includes the set of sequences ( $S_m(K)$ ,  $K=0, 1, \dots, N-1$ ) which are used by the network at the instant of assigning (difference classes of sequences as disclosed in section 2 are candidates for the selection of asynchronous MC-CDMA spreading sequences at the instant and after the instant of assigning) as claim.

Referring to claim 20, Popovic discloses in figure 1 and in sections 2 on pages 2 and 3 of a method wherein the predetermined set of spreading sequences includes the set of sequences ( $S_m(K)$ ,  $K=0, 1, \dots, N-1$ ) which are potentially usable after the instant of assigning (difference classes of sequences as disclosed in section 2 are candidates for the selection of asynchronous MC-CDMA spreading sequences at the instant and after the instant of assigning) as claim.

Referring to claim 21, Popovic discloses in section 4 on pages 4 and 5 and conclusion of a method wherein the set of spreading sequences includes a favored set of spreading sequences based on numerical results between Walsh and Gold sequences as well as Orthogonal Gold and Zadoff-Chu sequences, taking into account the crest factors and the dynamic ranges, the set of Zadoff-Chu sequences seems to have the best performance for the application in the asynchronous MD-CDMA systems) as claim.

Referring to claim 23, Popovic discloses in figure 1 and in section 4 on pages 4 and 5 and conclusion a method wherein each user is assigned a spreading sequence so as to take into account the transmission quality predicted for the spreading sequence based on numerical results between Walsh and Gold sequences as well as Orthogonal Gold and Zadoff-Chu sequences,

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taking into account the crest factors and the dynamic ranges, the set of Zadoff-Chu sequences seems to have the best performance for the application in the asynchronous MD-CDMA systems) as claim.

Referring to claim 31, Popovic discloses in section 4 on pages 4 and 5 and conclusion wherein the method is implemented dynamically and includes re-assigning during transmission, at predetermined instants (Zadoff-Chu sequences are assigned dynamically and may be dynamically reassigned since any pair of sequences in this set has the optimum period crosscorrelation function with the constant magnitude as disclosed in the Numerical results section) as claim.

#### ***Allowable Subject Matter***

3. Claims 22, 24-30, 32 and 33 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

4. Applicant's arguments filed 11/16/04 have been fully considered but they are not persuasive.

5. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., A method for dynamically assigning spreading sequence and is used to dynamically assign sequences as soon as the number of sequences needed in the network is changed) are not recited in the rejected

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claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

6. Referring to claims 18 and 34, Applicants argue that page 1 figure 1 of Popovic's paper does not disclose a method for assigning a spreading sequence. Applicants believe page 1, figure 1 only appears to disclose a method for using a spreading sequence and nothing is disclosed of how the spreading sequence  $S_m(k)$  is selected for user  $k$ . Examiner respectfully disagrees and redirects Applicants to Popovic's paper. Popovic clearly discloses in figure 1 and in 3<sup>rd</sup> paragraph of 1<sup>st</sup> col. on page 1 and in 1<sup>st</sup> paragraph of 2<sup>nd</sup> col. on page 2 of user  $m$  being assigned,  $S_m(K)$  spreading sequences. Popovic further discloses in the abstract and in section 2- Selection criteria for MC-CDMA sequences on page 2-3, according to figure 1,  $S_m(k)$  is employed for spreading and is the spreading sequence assigned to the user  $m$ , spectral correlation function is used for evaluation of MC-CDMA sequence, the spectral correlation function as disclosed in column 1 of page 3, is the measure of mutual interference between a pair of users in the MC-CDMA system and spectral PDFs are calculated for a few different classes of spreading sequences and overall system performance is used to select the best set of spreading sequence. The best set of spreading sequence  $S_m(K)$  is employed and assigned for figure 1 using the same aforementioned basic criterion as is the case on page 2, last paragraph of page 2, where orthogonal sequence is employed. Thus, Popovic does teach or suggest the claimed features of claims 18 and 34 for assigning a user one or more spreading sequence. Therefore, claims 18 and 24 respectfully remain rejected.

**Any response to this action should be mailed to:**



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Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**Or faxed to:**

(703)305-3988, (for formal communications intended for entry)

**Or:**

(703)305-3988 (for informal or draft communications, please label "Proposed" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chirag G Shah whose telephone number is 571-272-3144. The examiner can normally be reached on M-F 6:45 to 4:15, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on 571-272-3134. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cgs  
January 14, 2005

  
**Ajit Patel**  
Primary Examiner